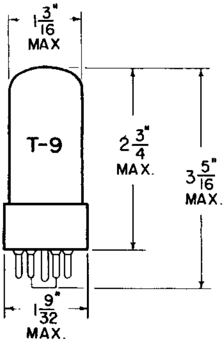
TUNG-SOL

TWIN TRIODE

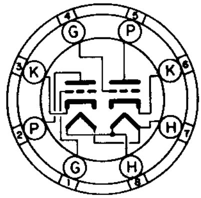


GLASS BULB

COATED UNIPOTENTIAL CATHODE

HEATER
6.3 VOLTS 0.6 AMP.
AC OR DC

ANY MOUNTING POSITION



BOTTOM VIEW
INTERMEDIATE SHELL
8 PIN OCTAL
8BD

THE 6SN7WGTA IS A RUGGEDIZED, MEDIUM MU, TWIN TRIODE IN THE OCTAL BASE, BANTAM CONSTRUCTION. THE TWO TRIODE SECTIONS ARE ELECTRICALLY INDEPENDENT, ALLOWING SIMULTANEOUS USE OF THE TWO IN COMPLETELY DIFFERENT APPLICATIONS. THE TYPE IS SUITABLE FOR A WIDE RANGE OF GENERAL PURPOSE APPLICATIONS SUCH AS OSCILLATORS, MULTIVIBRATORS, RESISTANCE-COUPLED VOLTAGE AMPLIFIER, ETC. CONTROLS ON THE PRODUCT AVERAGE FOR SUCH CHARACTERISTICS AS TRANSCONDUCTANCE ASSURE THAT THESE CRITICAL CHARACTERISTICS WILL REMAIN WELL CENTERED. SINCE IT MUST BE ABLE TO WITHSTAND SEVERE MECHANICAL TESTS TO MEET TEST SPECIFICATIONS, THE 6SN7WGTA IS ESPECIALLY SUITED FOR USE IN MILITARY AND INDUSTRIAL AIRBORNE EQUIPMENT WHICH MAY BE SUBJECTED TO SEVERE SHOCK AND VIBRATION.

DIRECT INTERELECTRODE CAPACITANCES

NO EXTERNAL SHIELD

	TRIODE #1	TRIODE #2	
GRID TO PLATE (RATED)	4.0	3.8	μμf
MAXIMUM	4.0	4.0	μμf
MINIMUM	3.0	3.0	μμf
INPUT (RATED)	2.2	2.6	μμf
MAXIMUM	2.7	2.7	μμf
MINIMUM	1.7	1.7	μμf
OUTPUT (RATED)	0.7	0.7	μμf
MAXIMUM	1.20	1.20	μμf
MINIMUM	0.60	0.60	μμf

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TUNG-SOL

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RATINGS

ABSOLUTE MAXIMUM VALUES

HEATER VOLTAGE	6.3±5%	VOLTS
MAXIMUM DC PLATE VOLTAGE	330	VOLTS
MAXIMUM PLATE DISSIPATION (PER PLATE)	3.44	WATTS
MAXIMUM GRID RESISTANCE	1.1	MEGOHMS
MAXIMUM HEATER-CATHODE VOLTAGE	2.5	VOLTS
MAXIMUM DC PLATE CURRENT (PER PLATE)	20.0	mAdc
MAXIMUM BULB TEMPERATURE	200	°C
MAXIMUM ALTITUDE	60 000	FEET

TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

CLASS A_1 AMPLIFIER

EACH UNIT

HEATER VOLTAGE	6.3	6.3	VOLTS
HEATER CURRENT	0.6	0.6	AMP.
PLATE VOLTAGE	90	250	VOLTS
GRID VOLTAGE	0	-8	VOLTS
PLATE CURRENT	10	9	mA.
AMPLIFICATION FACTOR	20	20	
PLATE RESISTANCE (APPROX.)	6 700	7 700	OHMS
TRANSCONDUCTANCE	3 000	2 600	μMHOS
PLATE CURRENT @ E_c =- 12.5 VOLTS	---	1.3	mA.
GRID VOLTAGE FOR Ib = 10 μA (APPROX.)	-7.0	-18	VOLTS

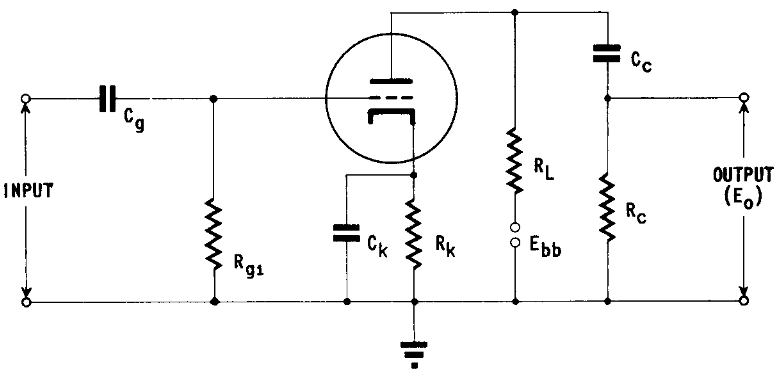
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TUNG-SOL

RESISTANCE-COUPLED AMPLIFIER

R_L MEG.	R_{g1} MEG.	R_s MEG.	E_{bb} = 90 VOLTS			E_{bb} = 180 VOLTS			E_{bb} = 300 VOLTS		
			R_k	GAIN	E_o	R_k	GAIN	E_o	R_k	GAIN	E_o
0.10	A	0.10	3300	14	13	2200	14	26	1800	14	40
0.10	A	0.24	3600	14	16	2700	15	33	2200	15	51
0.24	A	0.24	7500	14	16	5100	15	30	4300	15	44
0.24	A	0.51	9100	14	19	6800	15	39	5100	15	54
0.51	A	0.51	13000	14	16	9100	15	30	6800	16	40
0.51	A	1.0	15000	14	19	10000	16	32	7500	16	45
0.24	10	0.24	0	15	13	0	16	33	0	17	46
0.24	10	0.51	0	16	17	0	17	38	0	18	62
0.51	10	0.51	0	16	14	0	18	32	0	18	53
0.51	10	1.0	0	17	18	0	18	41	0	19	68

[A] VALUE OF R_{g1} IS NOT CRITICAL.
GAIN MEASURED AT E_o = 2.0 VOLTS RMS OUTPUT.
E_o IS RMS OUTPUT FOR 5% TOTAL HARMONIC DISTORTION.



NOTE: COUPLING CAPACITORS C_g AND C_c SHOULD BE SELECTED TO GIVE DESIRED FREQUENCY RESPONSE. R_k SHOULD BE ADEQUATELY BY-PASSED BY CAPACITOR C_k.

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TUNG-SOL

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CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

Ef=6.3V, Eb=250Vdc, Ec=−8Vdc, Ehk=0
EXCEPT AS MODIFIED BELOW

	INITIAL				500 HOUR LIFE TEST		
	INDIVIDUAL MIN.	INDIVIDUAL MAX.	PROD. MIN.	AVG. MAX.	INDIVIDUAL MIN.	INDIVIDUAL MAX.	
HEATER CURRENT	550	650	---	---	550	650	mA.
HEATER—CATHODE LEAKAGE (Ehk=±250 Vdc)	---	±25	---	---	---	±25	µAdc
INSULATION OF ELECTRODES[B] (Ef=6.3V.)							
E(g—ALL)	100	---	---	---	50	---	MEGOHMS
E(p—ALL)	100	---	---	---	50	---	MEGOHMS
GRID CURRENT[A]	0	−1.5	---	---	0	−1.5	µAdc
PLATE CURRENT (1)	5.5	12.5	---	---	---	---	mAdc
PLATE CURRENT (2) (Ec=−21Vdc)	---	50	---	---	---	---	µAdc
TRANSCONDUCTANCE (1)	2075	3125	2400	2800	---	---	µMHOS
CHANGE IN INDIVIUAL TUBES	---	---	---	---	---	15	PERCENT
AVERAGE CHANGE	---	---	---	---	---	15	PERCENT
ΔTRANSCONDUCTANCE (2) (Ef=5.7V)	---	15	---	---	---	15	PERCENT
GRID EMISSION[E] (Ef=7.5V, Ec=21Vdc, Rg/g=1.0 MEG.)	0	−1.5	---	---	---	---	µAdc
PLATE CURRENT (3) (Ec=−14 Vdc)	---	---	---	---	---	---	µAdc
AF NOISE[EA] (Esig=70mVac, Rp=0.01MEG.)	---	17	---	---	---	---	VU
TRANSCONDUCTANCE (3) (Eb=90 Vdc, Ec = 0)	2400	3600	---	---	---	---	µMHOS
AMPLIFICATION FACTOR[F]	18	23	---	---	---	---	

SPECIAL REQUIREMENTS

	MIN.	MAX.	
CONTINUITY AND SHORTS[G] (INOPERATIVES)	---	---	
LOW PRESSURE VOLTAGE BREAKDOWN (PRESSURE = 55±5mm HG; VOLTAGE = 500Vac)	---	---	
LOW FREQUENCY VIBRATION[AHK] (Rp= 2000 OHMS)	---	50	mVac
SHOCK[L] (HAMMER ANGLE = 30°, Ehk=+100 Vdc)	---	---	
VIBRATIONAL FATIGUE[M] (G= 2.5, FIXED FREQUENCY; F= 25 MIN., 60 MAX.)	---	---	
POST SHOCK AND VIBRATIONAL FATIGUE TEST END POINTS			
LOW FREQUENCY VIBRATION	---	75	mVac
HEATER CATHODE LEAKAGE (Ehk=±250 Vdc)	---	±75	µAdc
PLATE CURRENT (2)	---	150	µAdc
ΔTRANSCONDUCTANCE (1) OF INDIVIDUAL TUBES	---	20	PERCENT
HEATER CYCLING LIFE TEST (Ef=7.5V, Eb=Ec=0, Ehk=+135 Vdc, 1 MIN. ON 4 MIN. OFF)	---	---	

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TUNG-SOL

SPECIAL REQUIREMENTS – CONT'D.

1 HOUR STABILITY LIFE TEST			
(Ehk=+250 Vdc, Rg/g=1.0 MEG, TA=ROOM)	---	---	
STABILITY LIFE TEST END POINTS			
ΔTRANSCONDUCTANCE (1) OF INDIVIDUAL TUBES	---	10	PERCENT
100 HOUR SURVIVAL-RATE LIFE TEST			
(STABILITY LIFE TEST CONDITIONS OR EQUIVALENT, TA = ROOM)	---	---	
100 HOUR SURVIVAL-RATE TEST END POINTS			
CONTINUITY AND SHORTS (INOPERATIVES)	---	---	
TRANSCONDUCTANCE (1)	1850	---	μMHOS
INTERMITTENT LIFE TEST			
STABILITY LIFE TEST CONDITIONS TA=ROOM	---	---	

NOTES

[A] TIE 1K TO 2K, 1g TO 2g; AND 1p TO 2p.

[B] SEE MIL-E-1C 4.8.2

[C] SEE MIL-E-1C

[D] PRIOR TO THIS TEST, TUBES SHALL BE PREHEATED 5 MINUTES WITH BOTH SECTIONS OPERATING SEPARATELY AT CONDITIONS INDICATED BELOW. THE TUBES SHALL BE TESTED IMMEDIATELY AFTER PREHEATING. THE THREE MINUTE TEST IS NOT PERMITTED. GRID EMISSION SHALL BE THE LAST TEST PERFORMED ON THE SAMPLE SELECTED FOR THE GRID EMISSION TEST. Ef=7.5Vdc, Ec1=-8Vdc, Eb=250Vdc, Rg=1.0 MEG.

[E] SEE MIL-E-1C 4.10.3.2

[F] SEE MIL-E-1C 4.10.11.1

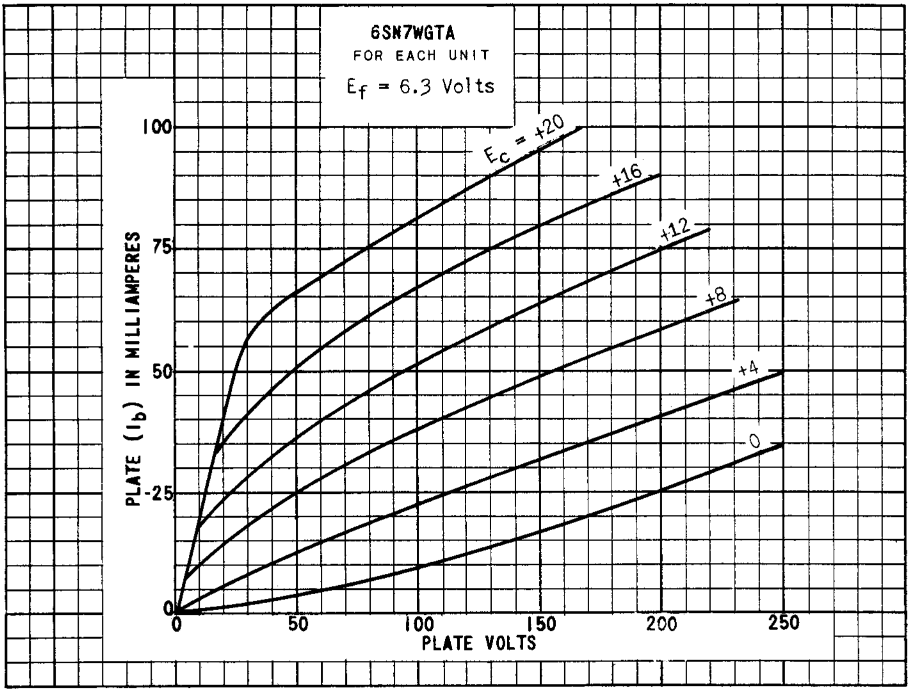
[G] SEE MIL-E-1C 4.7.5

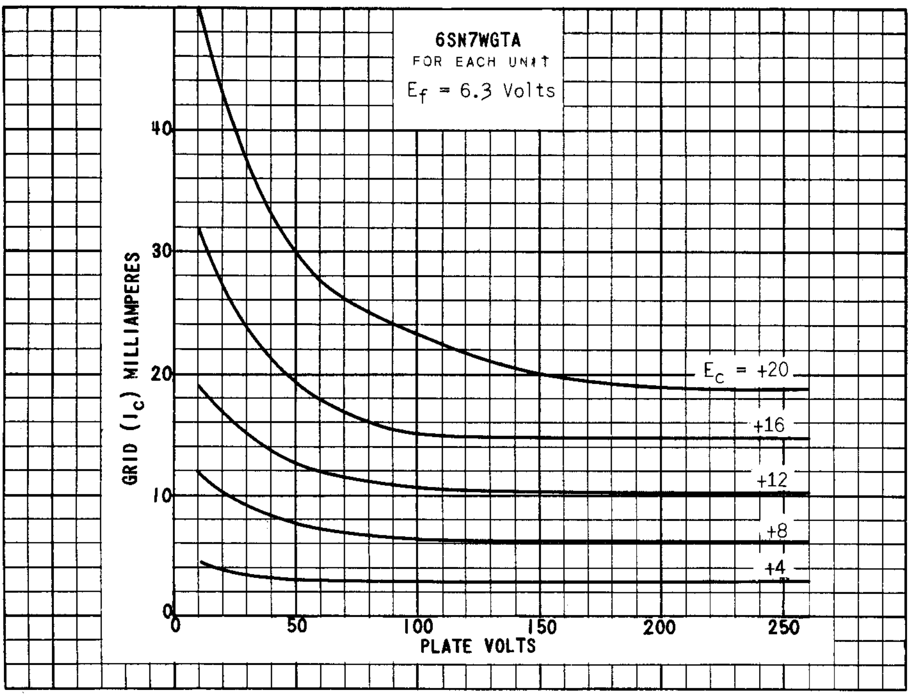
[H] SEE MIL-E-1C 4.19.9.1

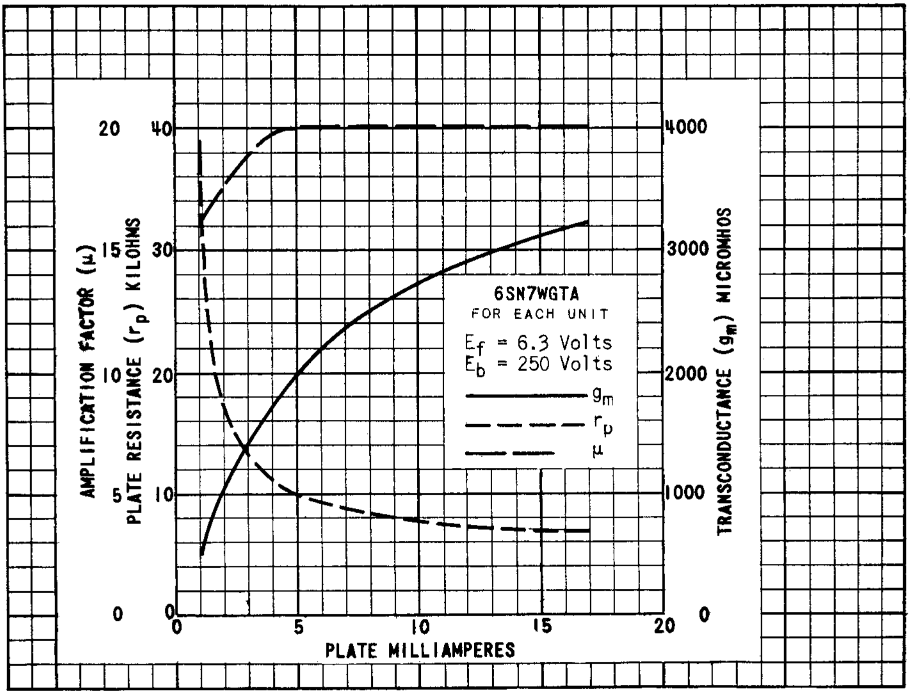
[K] THE IMPEDANCES OF THE PLATE VOLTAGE SUPPLIES SHALL NOT EXCEED THAT OF A 40μf CAPACITOR @ 10CPS.

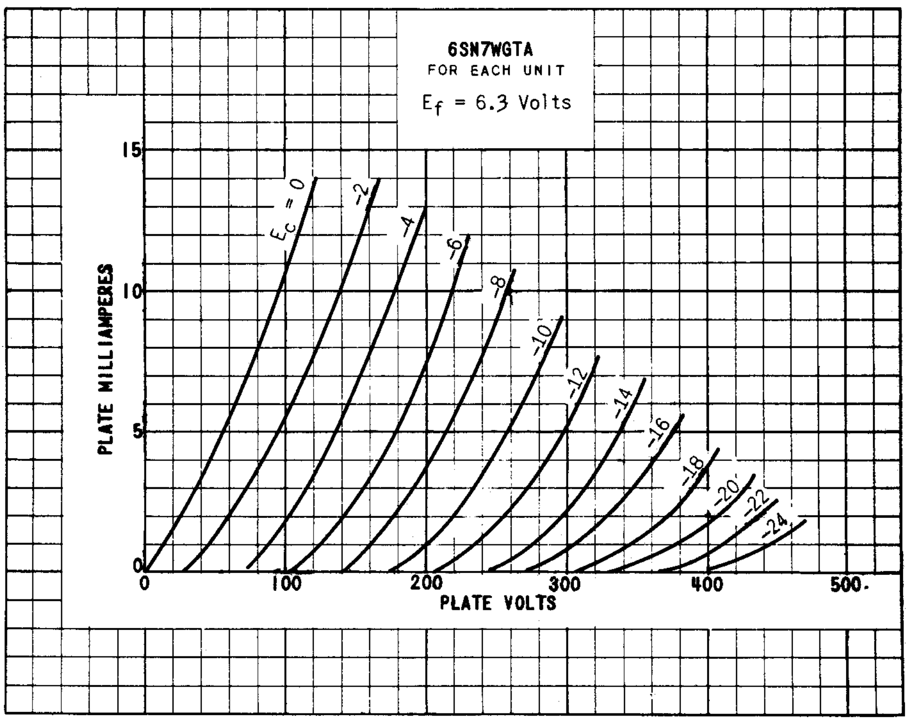
[L] SEE MIL-E-1C 4.9.20.5

6SN7WGTA
PREMIUM TUBE-NAVY






6SN7WGTA
FOR EACH UNIT
Ef = 6.3 Volts
Eb = 250 Volts
gm
rp
μ
AMPLIFICATION FACTOR (μ)
PLATE RESISTANCE (rp) KILOHMS
TRANSCONDUCTANCE (gm) MICROMHOS
PLATE MILLIAMPERES
0
5
10
15
20
0
10
20
30
40
0
1000
2000
3000
4000
0
5
10
15
20


6SN7WGTA
FOR EACH UNIT
Ef = 6.3 Volts
PLATE MILLIAMPERES
PLATE VOLTS
Ec = 0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
0
5
10
15
0
100
200
300
400
500